

OMB had several questions concerning the generic testing to be used on the Biomass/Residue study. The following questions and answers address these issues.

### Supporting Statement

- 1) Q. Please describe how farm operators will be selected. Will it be from a list? Owned by NASS?
  - A. Farm operators will be distributed across the watershed and field samples will be created by ARS. Fields will be selected to represent all tillage classes from intensive (<15% crop residue cover) to no-till (>60% residue cover) as determined by remote sensing. ARS will send their sample points to NASS/Spatial Analysis Research Section (SARS), who will in turn determine the farmer identity via FSA/CLU farm-id. SARS will send the CLU farm-id to NASS/Information Services Section (ISS) to determine farmer address/contact information. ISS will provide this information directly to the Iowa Field Office for contacting growers.
  
- 2) Q. It seems that you have two research objectives with this pilot. The first relates to information collected from about 60 operators. This information will be used to measure the accuracy of measurement of residue (in person through observation and remotely sensed). The second relates to information collected from the subsample of 25 operators. This information will be used to preliminarily examine possible exposure outcome relationship between residue in crop production and resulting residue in soil. Please confirm and make more explicit under "Purpose of the Test." Please describe briefly how your data will be evaluated to answer your research questions (for the former test, perhaps concurrent validity; for the latter test, some critical value).
  - A. For the first set, crop residue cover will be measured directly using the line-point transect method (NRCS standard method). These data provide 'ground truth' measurements that will be used to calibrate and test models to estimate crop residue cover using advanced multispectral and hyperspectral imaging systems. The fields will be selected to span the full range of crop residue cover values expected within the watershed. Shortly after harvest, crop residues often completely cover the soil, but tillage, decay, and residue harvesting for biofuel reduce crop residue cover. Classification of remotely sensed images will provide spatially explicit estimates of crop residue cover and soil tillage intensity throughout the watershed. Our goal is to evaluate the effects of crop management decisions on soil and water quality within this Conservation Effects Assessment Project (CEAP) watershed. Crop residue cover shortly after planting is a good indicator of the intensity of soil tillage and the extent of soil conservation practices. These data are crucial for accurately modeling soil and water quality, but are often assumed to uniform across the study area due to the lack of reliable input data.

For the second set, above-ground biomass samples of corn will be collected after physiological maturity, but before harvest, and grain weight and total biomass will be determined. Although total biomass and grain weights vary, the ratio of grain weight divided by total biomass (harvest index) is relatively stable. We will use harvest index and grain yield, provided by the farm operators, to estimate the maximum amount of crop residue that could be available for biofuel production. We will use process-based models (i.e., SWAT, APEX, EPIC) to simulate the impact of various biofuel harvesting scenarios on soil and water quality.

- 3) Q. Please provide a power analysis for each of these research objectives. (How do you know that 60 will be sufficient for the first phase of your test? 25 for the second phase?) Please be specific. Does this account for expected attrition (if any)?
- A. Based on our previous research, crop residue cover is linearly related to selected advanced multispectral and hyperspectral residue indices. The relationships are robust. A set of 60 well distributed measurements of crop residue cover should provide ample data for calibrating and testing the models. Although grain weight and total biomass vary widely (coefficients of variation >20%), harvest index is relatively conservative (CV <10%). With 25 samples, we expect to detect 5-6% changes in harvest index for  $\alpha=0.05$  and  $\beta=0.2$ . The sample size is sufficiently large that a 10-15% attrition rate would not require contacting additional respondents.
- 4) Q. Regarding the production of a yield map, please clarify. Will you be requesting one if the operator has one? Or, will you be asking the operator to make one? And the reference to "if possible" relates to availability or cooperation? If possible relates to mostly availability, but the possibility exists the operator may not want to provide his/her yield map.
- A. Many farmer operators have grain combines with yield monitors and GPS equipment that are required to produce a yield map of each field. We are asking the farm operator to share a copy of their map with us.

## Instruments

- 1) Q. I am guessing that the farm operators selected for this information collection will be identified from a list frame. Does the list frame include the latitude/longitude of the field and the closest road intersection (section 1 of the Cropping Practices Survey)? The crops grown there in 2011 (Section 2 of the Cropping Practices Survey)? If so, can these items be omitted from the survey?
- A. The List Frame does not contain a consistent field for either item and is not utilized for this project. We are simply trying to verify that the operator and enumerator are talking about the same field. We could use township and range instead of road intersection and latitude/longitude.
- 2) Q. Re: Section 3, regarding crops grown in spring 2012, won't this proposed information collection collect this information? If so, can these items be omitted from the survey?
- A. We are verifying that we are talking about the same field. So no, please don't omit/remove from the survey.
- 3) Q. Regarding self-report of residue remaining on soil (item 2, section 3; item 6 section 3; item 8, section 4, please confirm that you believe the respondent has capacity to respond to this question accurately by self-report. Also, if the items are to be retained, consider adding boldface to unique phrases (the questions sound very similar).
- A. In item 2, ARS is looking for information on amount of residue cover on the soil after winter and before spring tillage. In item 6 ARS is focusing on Spring tillage operations. In item 8, ARS focuses on Fall 2012 tillage operations.

The farm operator's perception of the residue cover in his field is important. In my limited conversations with farm operators, most think they have more cover than we measured. If this is true, we (ARS, NRCS, state extension service) have more work to do to meet soil and water quality goals.

The three questions focus on tillage operations during different times of the year. We are asking what tillage occurred during the previous Fall and Spring before the crop was planted and immediately after the crop was harvested. If we had a continuous record for each field, we would not ask for information for the three different times of the year. Previous crop often determines the intensity of soil tillage required for the succeeding crop. Since we only sample corn fields for biomass, we need information on the previous crop and tillage before planting corn.